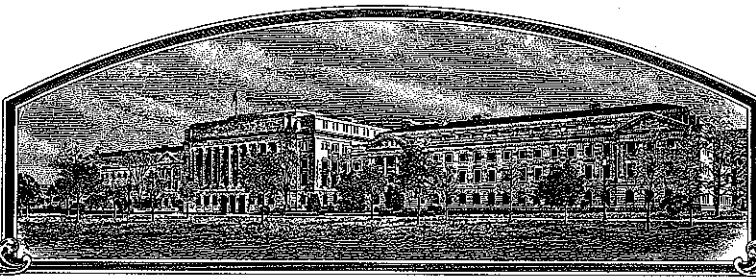


No.

200100135



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME;

Central Valley Seeds, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

LETTUCE

'Thermo Cos'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this fourteenth day of February, in the year two thousand and six.

Attest:


Commissioner
Plant Variety Protection Office
Agricultural Marketing Service


Secretary of Agriculture



U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICEAPPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER Central Valley Seeds, Inc.		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME GP2-2-7-3-3-1-mass-mass-mass		3. VARIETY NAME Thermo Cos	
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) 485 Victor Way, Suite 10 Salinas, CA 93907		5. TELEPHONE (include area code) 831-757-0939		FOR OFFICIAL USE ONLY	
		6. FAX (include area code) 831-7576829		PVPO NUMBER 200100135	
7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) Corporation		8. IF INCORPORATED, GIVE STATE OF INCORPORATION California		FILING DATE March 16, 2001	
9. DATE OF INCORPORATION 04/17/87					
10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. (First person listed will receive all papers) Tony M. Avila Dan Avila Joe Avila John Avila				FILING AND EXAMINATION FEES: \$2705 - DATE March 16, 2001 CERTIFICATION FEE: \$682 - DATE Dec. 9, 2005	
11. TELEPHONE (include area code) 831-757-0939		12. FAX (include area code) 831-7576829		13. E-MAIL	
				14. CROP KIND (Common Name) Lettuce	
18. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse) a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of Variety d. <input checked="" type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional) e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Owner's Ownership f. <input checked="" type="checkbox"/> Voucher Sample (2,500 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository) g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$2,705), made payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office)			19. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? See Section 83(a) of the Plant Variety Protection Act <input type="checkbox"/> YES (If "yes", answer items 20 and 21 below) <input checked="" type="checkbox"/> NO (If "no," go to item 22)		
			20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? <input type="checkbox"/> YES <input type="checkbox"/> NO IF YES, WHICH CLASSES? <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED		
			21. DOES THE OWNER SPECIFY THAT THE CLASSES BE LIMITED AS TO NUMBER OF GENERATIONS? <input type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY THE NUMBER 1, 2, 3, etc. <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED (If additional explanation is necessary, please use the space indicated on the reverse.)		
22. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO 3/21/2000 USA Commercial Trial IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. (Please use space indicated on reverse.)			23. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. (Please use space indicated on reverse.) USA, March 2001, USPTO		
24. The owners declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate. The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Owner(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.					
SIGNATURE OF OWNER Tony M. Avila NAME (Please print or type) Tony M. Avila			SIGNATURE OF OWNER Dan Avila NAME (Please print or type) DAN AVILA		
CAPACITY OR TITLE Sale & R&D		DATE 3-12-01		CAPACITY OR TITLE CFO	
				DATE 3/14/2001	

GENERAL: To be effectively filed with the Plant Variety Protection Office (PVPO), **ALL** of the following items must be **received** in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E; (3) for a seed reproduced variety at least 2,500 viable untreated seeds, for a hybrid variety at least 2,500 untreated seeds of each line necessary to **reproduce** the variety, or for tuber reproduced varieties verification that a viable (*in the sense that it will reproduce an entire plant*) tissue culture will be deposited and maintained in an approved public repository; (4) check drawn on a U.S. bank for \$3,652 (\$432 filing fee and \$3,220 examination fee), payable to "Treasurer of the United States" (See Section 97.6 of the Regulations and Rules of Practice.) Partial applications will be held in the PVPO for not more than 90 days, then returned to the applicant as unfilled. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 401, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. **DO NOT** use masking materials to make corrections. If a certificate is allowed, you will be requested to send a check payable to "Treasurer of the United States" in the amount of \$432 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

Plant Variety Protection Office

Telephone: (301) 504-5518

FAX: (301) 504-5291

Homepage: <http://www.ams.usda.gov/science/pvpo/pvpindex.htm>

To avoid conflict with other variety names in use, the applicant must check the appropriate recognized authority and provide evidence that name has been cleared by the appropriate recognized authority before the Certificate of Protection is issued. For example, for agricultural and vegetable crops, contact: Seed Branch, AMS, USDA, 10301 Baltimore Avenue, Suite 401 NAL Building, Beltsville, MD 20705. Telephone: (301) 504-5682 <http://www.ams.usda.gov/lsg/seed.htm>.

ITEM

- 19a. Give: (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method;
(2) the details of subsequent stages of selection and multiplication;
(3) evidence of uniformity and stability; and
(4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified
- 19b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:
(1) identify these varieties and state all differences objectively;
(2) attach statistical data for characters expressed numerically and demonstrate that these are clear differences; and
(3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness.
- 19c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.
- 19d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc.
- 19e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.
20. If "Yes" is specified (*seed of this variety be sold by variety name only, as a class of certified seed*), the applicant **MAY NOT** reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. (See Regulations and Rules of Practice, Section 97.103).
23. See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.
24. See Section 55 of the Act for instructions on claiming the benefit of an earlier filing date.

22. CONTINUED FROM FRONT (Please provide a statement as to the limitation and sequence of generations that may be certified.)

N/A

23. CONTINUED FROM FRONT (Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)

March 16th, 2000

24. CONTINUED FROM FRONT (Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)

US Patent # 6,649,816 B2

NOTES: It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. The fees for filing a change of address; owner's representative; ownership or assignment; or any modification of owner's name is specified in Section 97.175 of the regulations. (See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 1.4 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, sexual orientation, marital or family status, political beliefs, parental status, or protected genetic information. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call 202-720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

Exhibit A. Origin and Breeding History of Lettuce Variety 'Thermo Cos'

'Thermo Cos' is a Romaine or Cos type lettuce, *Lactuca sativa* L., variety. Figure 1, illustrates the pedigree and the invention history of 'Thermo Cos'. 'Thermo Cos' originated from a single black-seeded plant growing in the middle of the white-seeded Oasis crisphead seed production field of Central Valley Seeds, Inc. in San Joaquin Valley, California in summer of 1992. The plant selection was utterly based on the presence of a black-seeded lettuce off-type with semi-romaine leaf structure growing among the white seeded crisphead seed production field. The selected plant was labeled as GP2-2 and was allowed to self-pollinate in the field and the resulting seeds were collected. *Single plant selection program was used as a breeding method for the*

In August of 1992, approximately 60 plants of GP2-2 were grown in Huron, California. A number of crisphead types (percentage not available) along with assortment of plants with variable shapes and leaf color, were observed. Seventeen romaine plants were individually selected for having dark green leaf color, extended plant height, thick and moderate savoy (blistering) leaves with slight leaf undulation and resistance to tipburn. The selected plants were labeled as GP2-2-1 through GP2-2-17 and were allowed to self-pollinate and the resulting seeds were collected. In the following year randomly 7 of the 17-selfed seed lines, GP2-2 Sel-1, 3, 5, 7, 9, 13, & 17, were planted in a field trial located at Hacienda Farms, Salinas, California. Several lines were segregating for different plant type, leaf structure, and color. Consideration was mainly given to line GP2-2 Sel-7 for having plants with medium height displaying wide to medium frame composition, thick and moderate savoy (blistering) leaf texture, slight leaf undulation, dull (non-glossy) dark green leaf color, very short core length, no tipburn and with no losses to lettuce drop disease caused by *Sclerotinia minor* fungus. Instead of a straight upright leaf petioles, majority of the selected plants displayed a concaved butt shape with prominently raised midribs that was ascertained to be comparatively unmatched for a Cos type lettuce. Ten individual plants with the characteristics described were selected from line GP2-2 Sel-7 and were labeled as GP2-2 Sel-7-1 thru GP2-2 Sel-7-10. All plants, except GP2-2 Sel-7-2 and 3, died after greenhouse transplanting. The remaining two plant selections were allowed to self-pollinate and the resulting seeds were collected. *of the variety*

Seeds of the lines GP2-2 Sel-7-2 and 3 were planted in the company's research station, Soledad, California. Line GP2-2 Sel-7-2 was profoundly segregating and was drop from further evaluation and selection. However, four individual plants were selected from line GP2-2 Sel-7-3. These plants displayed wide to medium frame structure, thick and moderate savoy (blistering) leaf texture, slight leaf undulation, dull (non-glossy) dark green leaf color, very short core length, no tipburn with slight internal cupping, and a concaved butt shape with prominently raised midribs. Selections were labeled as GP2-2 Sel-7-3-1 thru GP2-2 Sel-7-3-4 and were allowed to self-pollinate and the resulting seeds were collected. *END 7/22/05*

Intense heat is considered unfavorable for production of fresh market lettuce. Due to severe sun injuries, i.e. tipburn, scorching or leaf twisting, no fresh market lettuce is produced during the very hot summer months in the San Joaquin Valley, California. No adverse reaction to tipburn or scorching had been noticed during the field observation and selection of the breeding lines. For the extent of tipburn resistance and other heat related injuries, in 1995 a decision was made to conduct future field evaluations and plant selections under extreme heat in the Central Valley Seeds' Jensen Research station in Sanger, California. Individual plants from lines *GP2-2 Sel-7-3-1* thru *GP2-2 Sel-7-3-4* were appeared to possess the described selection criteria and were emerging to be genetically stable. In addition, tipburn, scorching and leaf twisting caused by excess heat were markedly absent. Therefore, from each line, six individual plants were selected and were labeled accordingly. The plants were allowed to self-pollinate and the resulting seeds were collected.

Since the lines were appeared to be genetically stable, only the first two seed lines from each selection were evaluated in 1996. Other than expected minor variances due to the environmental factors, it was evident that all of the selected lines were judged to be genetically stable and uniform. Plants in the ^{F₅} line *GP2-2 Sel-7-3-3-1* appeared to possess the most uniformity and displayed wide to medium frame structure, thick and slightly savoy (blistering) leaf texture, moderate leaf undulation, dull (non-glossy) dark green leaf color, very short core length, no tipburn or scorching, slight internal cupping, and a concaved butt shape with prominently raised midribs. No further individual plant selection was made. The entire *GP2-2 Sel-7-3-3-1* line was massed together and was allowed to self-pollinate and the resulting seeds were collected. ^{and gene stability}

Field performance of the resulting massed seeds was re-evaluated in the 1997 trial. Line *GP2-2 Sel-7-3-3-1-mass* displayed the uniformity and stability for all the traits described. The entire *GP2-2 Sel-7-3-3-1-mass* line was labeled as *GP2-2 Sel-7-3-3-1-mass-mass* and was massed together for another generation. The plants were allowed to self pollinate and the resulting seeds were collected. ^{RAO 7/22/05}

In summer of 1998 seed line *GP2-2 Sel-7-3-3-1-mass-mass* was re-evaluated in the company's Jensen Research Station in Sanger, California. The resulting plants shown the uniformity and stability for wide to medium frame structure, thick and slightly savoy (blistering) leaf texture, moderate leaf undulation, dull (non-glossy) dark green leaf color, very short core length, no tipburn or scorching, slight internal cupping, and a concaved butt shape with prominently raised midribs. Plants from the entire line were collectively massed as *GP2-2 Sel-7-3-3-1-mass-mass-mass* and were allowed to self-pollinate and the resulting seeds were collected.

In 1999, the line *GP2-2 Sel-7-3-3-1-mass-mass-mass* was re-evaluated in Yuma, Arizona. Plants performed exceptionally well and displayed the uniformity and stability for all the traits described. The experimental designated breeding line *GP2-2 Sel-7-3-3-1-mass-mass-mass* was given the name '*Thermo Cos*' for its outstanding performance under extreme heat. '*Thermo Cos*' has been suggested for commercial planting as a Cos or Romaine cultivar in the warm regions of California and Arizona. Compared to other romaine varieties, '*Thermo Cos*' is unique for its class and is relatively medium in height, with a medium frame structure, thick and slightly savoy (blistering) leaf texture, moderate leaf undulation, dull dark green leaf color, very short core length, no tipburn or scorching, slight internal cupping, and a concaved butt shape with prominently raised midribs (See Figures 2, 3, 4 and 5). Compared to the available commercial romaine varieties, '*Thermo Cos*' is highly resistant to lettuce drop disease caused by *Sclerotinia minor* and shows very high degree of resistance to tipburn particularly several days passed its market stage. Interior leaves of other romaine varieties may be yellowish, but comparatively, '*Thermo Cos*' maintains its non-glossy dark green leaf color down to its interior small or baby leaves. Depending on the planting space and modified cultural practices, '*Thermo Cos*' can be grown for hearts or for fresh market lettuce approximately at 8 or 10 inch spacing, respectively.

'*Thermo Cos*' lettuce variety is distinct, genetically stable and uniform. After eight generations no variants or off types have been observed in commercial fields or the seed production trials. Seeds of '*Thermo Cos*' have been deposited with a public depository agency the American Type Culture Collection (ATCC), 10801 University Boulevard, Manassas, VA 20110-2209 under the Budapest treaty on March 20, 2000 and have assigned Accession number PTA-2252.

Addendum

The stock seeds for the experimental head lettuce "Oasis" was produced in 1991 in Central Valley Seeds' seed production field located in Jackson Farms, Corcoran, California. The lot number that was assigned to the small experimental seed increase was Corcoran R&D-91.

Central Valley Seeds did not plant or grow any lettuce, commercial or experimental, prior to 1991 in the very said location. Furthermore, to the best of our recollection, for three consecutive years prior to our lettuce seed crop, cotton had been grown and produced in the very same seed production field.

Figure 1. The Pedigree of Lettuce Cultivar 'Thermo Cos'

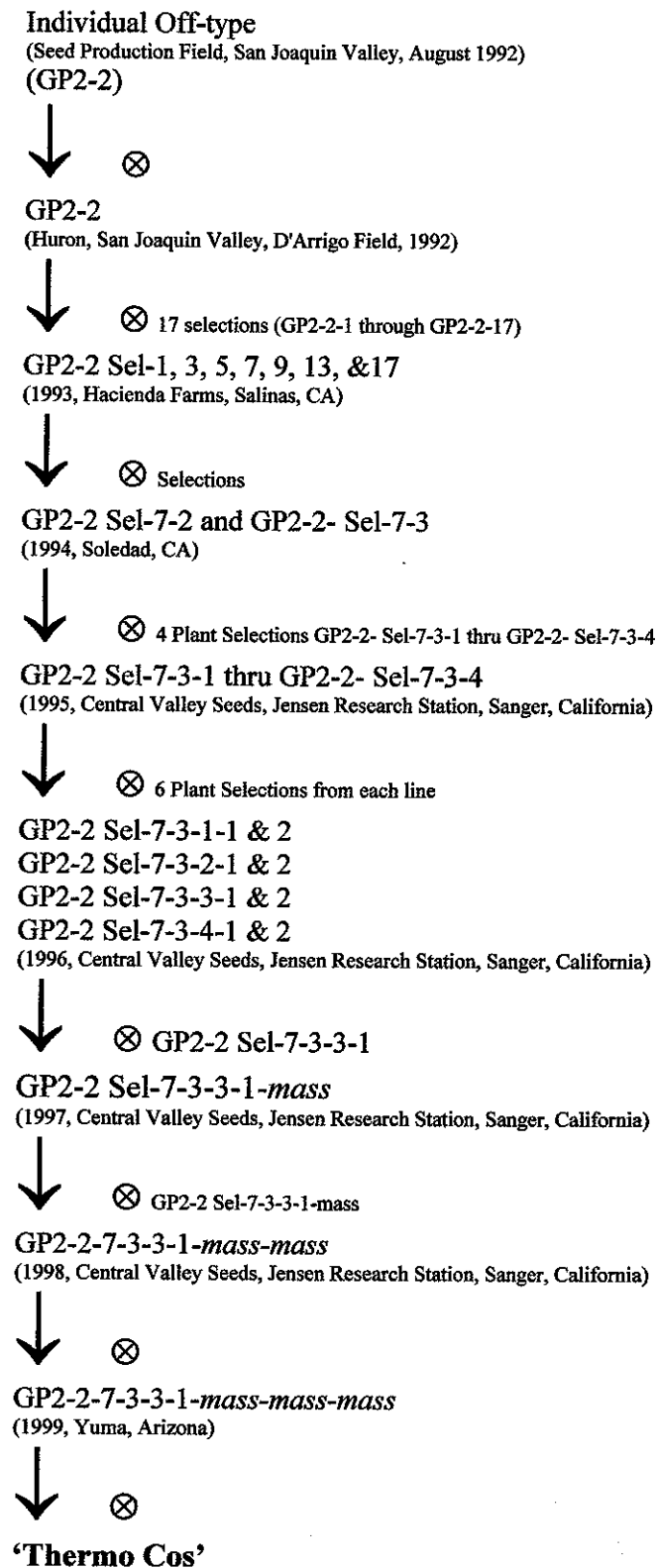


Exhibit B. Statement Of Distinctness

Statistical Analysis

Measurable characteristics were assessed in at several localities or dates and the results were analyzed separately. Unless otherwise indicated, the statistical analyses were performed using T-test. The results presented in actual t-values and probability values $p[t]$. The standard of deviation for each variety in the comparisons is presented in sigma values. LSD mean 95% corresponds to the Least Significant Difference between the means at the 95% probability level.

Statement Of Distinctness

'Thermo Cos' belongs to the Cos or romaine class of lettuce varieties. 'Thermo Cos' is adapted for the lettuce growing regions of California and Arizona. 'Thermo Cos' is unique for its class and is relatively medium in height, with a medium frame structure, thick and slightly savoy (blistering) leaf texture, moderate leaf undulation, dull dark green leaf color, very short core length, slight internal cupping, and a concaved butt shape with prominently raised midribs. 'Thermo Cos' appears relatively medium in height, compared to the standard commercial romaine varieties. The lengths of the leaves are compressed due to the concaved butt shape and leaf petiole curvature. 'Thermo Cos' expresses resistance to tipburn and lettuce drop caused by *Sclerotinia minor* pathogen. 'Thermo Cos' seed color is black with a gray-brown hue. 'Thermo Cos' is genetically pure and stable and has excellent seed emergence. Seeds of 'Thermo Cos' have been deposited with a public depository agency the American Type Culture Collection (ATCC), 10801 University Boulevard, Manassas, VA 20110-2209 under the Budapest treaty on March 20, 2000 and have assigned Accession number PTA-2252.

Example # 1

'Thermo Cos' is similar to 'King Henry'; however,

Area	'Thermo Cos'	'King Henry'
Leaf Blistering (Savoyedness)	Slight	Moderate
Plant Height	Medium	Tall
Leaf Glossiness	Dull	Semi-glossy
Leaf Color	Dark Green	Light Green Medium
Corky Root	Intermediate	Resistant
Maturity	About 2-3 Days Late	About 2-3 Days Early

RAD 7/22/00

Example # 2

'Thermo Cos' is most similar to 'King Henry'; however, 'Thermo Cos' has a dull (non-glossy) darker green leaf color than 'King Henry'.

According to the Munsell Color Chart for Plant Tissues, 'Thermo Cos' has Value 4 Chroma 4 Hue 7.5 GY and 'King Henry' has Value 4 Chroma 8 Hue 5 GY.

Example # 3

[▲] Trial Locations	▼Variable	t*-Value	p[t*]	Avg. 'Thermo Cos'	Avg. 'King Henry'	Sigma	LSD Mean 95%
1	Leaf Width (cm)	3.76	0.001	21.4	19.3	1.23	1.15
2	Leaf Width (cm)	3.55	0.002	21.5	19.5	1.24	1.16
1	Leaf Length (cm)	2.57	0.019	28.6	26.8	1.52	1.43
2	Leaf Length (cm)	2.75	0.013	29.0	27.1	1.58	1.49
1	Core Diameter (cm)	4.3	0.000	4.9	4.3	0.38	0.29
2	Core Diameter (cm)	3.6	0.002	5.0	4.3	0.40	0.37
1	◀Core Volume Index	2.57	0.019	156.0	126.9	25.2	23.6
2	◀Core Volume Index	2.35	0.030	169.5	136.2	31.5	29.6
1	▶Leaf Area Index	4.14	0.001	612.0	519.0	50.2	47.1
2	▶Leaf Area Index	3.95	0.001	625.4	530.0	53.9	50.7

[▲]Field Trial Locations:

Location 1: D'Arrigo Brothers, Ranch # 10, lot # 40, Greenfield, California. Water Date: 5/3/2000. Evaluation Date: 7/7/2000.

Location 2: D'Arrigo Brothers, Ranch # 11, lot # 21, Soledad, California. Water Date: 5/11/2000. Evaluation Date: 7/17/2000.

No. of reps: 10 plants per entry per trial.

▼Measurements in centimeters taken at market stage.

◀The core volume index is calculated by taking the core length multiplied by the core diameter².

▶The leaf area index compares the total leaf areas between the two varieties. This is calculated by multiplying the leaf width by the leaf length.

'Thermo Cos' is most similar to 'King Henry'; however, 'Thermo Cos' has wider leaves (cm) than 'King Henry' at market stage.

'Thermo Cos' is most similar to 'King Henry'; however, 'Thermo Cos' has longer leaves (cm) than 'King Henry' at market stage.

'Thermo Cos' is most similar to 'King Henry', however, 'Thermo Cos' has larger core diameter than 'King Henry' at market stage.

'Thermo Cos' is most similar to 'King Henry'; however, 'Thermo Cos' has larger core volume index than 'King Henry' at market stage.

'Thermo Cos' is most similar to 'King Henry'; however, 'Thermo Cos' leaf index is significantly different than 'King Henry'. In other words, 'Thermo Cos' has a different leaf shape, in relation to the width and length, than 'King Henry'.

Example # 4**Tipburn Resistance**

'Thermo Cos' is most similar to 'King Henry'; however, 'Thermo Cos' is highly resistant to tipburn than 'King Henry'.

[▲] Trial Location	No. Plants Per Rep	*No. Tipburn 'Thermo Cos'	No. Tipburn 'King Henry'	#p [Chi sq.]
1	25	0	6	0.014
2	25	0	5	0.025
3	25	0	4	0.045

[▲]Field Trial Locations:

Location 1: D'Arrigo Brothers, Ranch # 10, lot # 40, Greenfield, California. Water Date: 5/3/2000. Evaluation Date: 7/7/2000.

Location 2: D'Arrigo Brothers, Ranch # 11, lot # 21, Soledad, California. Water Date: 5/11/2000. Evaluation Date: 7/17/2000.

Location 3: D'Arrigo Brothers, Ranch # 14, lot # 13, Chular, California. Water Date: 5/18/2000. Evaluation Date: 7/25/2000.

*Presence or absence of plants with tipburn symptoms was recorded as 1 and 0, respectively.

#Statistical analysis based on the probability of one-tailed Chi-squared distribution at 95% level.

We would like to revise and amend the following statements to the Exhibit B: Statement of Distinctness of the above pending PVP application:

- a. Thermo Cos is most similar to King Henry; however, the cotyledon shape of Thermo Cos is broad and the cotyledon shape of King Henry is intermediate.
- b. Thermo Cos is most similar to King Henry; however, the cotyledon leaf undulation of Thermo Cos is slight and the cotyledon leaf undulation of King Henry is flat.
- c. Thermo Cos is most similar to King Henry; however, the leaf incision depth of Thermo Cos mature is absent and the mature leaf incision depth of King Henry is moderate.
- d. Thermo Cos is most similar to King Henry; however, the cotyledon leaf cupping of Thermo Cos is slight and the cotyledon leaf cupping of King Henry is uncupped.
- e. Thermo Cos is most similar to King Henry; however, the mature leaf undulation of Thermo Cos is absent and the mature leaf undulation of King Henry is moderate.
- f. Thermo Cos is most similar to King Henry; however, the butt shape of Thermo Cos is slightly concaved and the butt shape of King Henry is rounded.
- g. Thermo Cos is most similar to King Henry; however, the terminal inflorescence of Thermo Cos is absent and the terminal inflorescence of King Henry is present.
- h. Thermo Cos is most similar to King Henry; however, the lateral shoot above the head of Thermo Cos is absent and the lateral shoot above the head of King Henry is present.

AGRICULTURAL MARKETING SERVICE
LIVESTOCK AND SEED DIVISION
OBJECTIVE DESCRIPTION OF VARIETY
LETTUCE *Lactuca sativa*

EXHIBIT C

NAME OF APPLICANT (S) CENTRAL VALLEY SEEDS, INC. ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code) 485 VICTOR WAY, SUITE 10 SALINAS, CA. 93907	FOR OFFICIAL USE ONLY PVPO NUMBER 200700135 VARIETY NAME THERMO COS EXPERIMENTAL DESIGNATION 6P2-2-7-3-3-1-MASS·MASS·MASS
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Place numbers in the boxes for the characters which best describe this variety. Measured data should be the mean of an appropriate number (at least 10) of well spaced plants. Royal Horticultural Society or any recognized color standard may be used to determine plant colors.

The location of the test area is: **CALIFORNIA & ARIZONA** Color System Used: **MUNSELL COLOR CHART FOR PLANT TISSUE**

PLANT TYPE: (See list of suggested check varieties page 4.)

04

01=Cutting/Leaf
02=Butterhead
03=Bibb
04=Cos or Romaine

05=Great Lakes Group
06=Vanguard Group
07=Imperial Group
08=Eastern (Ithaca) Group

09=Stem
10=Latin
11=OTHER

SEED:	COLOR	LIGHT DORMANCY	HEAT DORMANCY
2	1=White (Silver Gray) 2=Black (Gray Brown) 3=Brown (Amber)	2 1=Light Required 2=Light Not Required	2 1=Susceptible 2=Not Susceptible

COTYLEDON TO FOURTH LEAF STAGE: NOTE: Provide a color photograph or photocopy of the fourth leaf from 20 day old seedling grown under optimal conditions.

1

SHAPE OF COTYLEDONS:

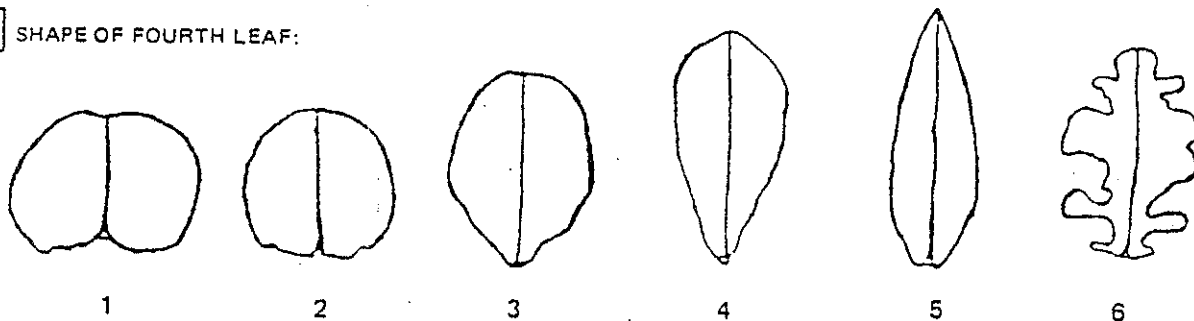
1=Broad

2=Intermediate

3=Spatulate

4

SHAPE OF FOURTH LEAF:



11

LENGTH/WIDTH INDEX OF FOURTH LEAF: L/W x 10

1

APICAL MARGIN:

1=Entire

4=Moderately Dentate

7=Lobed

4

BASAL MARGIN:

2=Crenate/Gnawed
3=Finely Dentate

5=Coarsely Dentate
6=Incised

8=OTHER (specify)

2

UNDULATION:

1=Flat

2=Slight

3=Medium

4=Marked

4

GREEN COLOR:

1=Yellow Green
2=Light Green

3=Medium Green
4=Dark Green

5=Blue Green
6=Silver Green

7=Gray Green

ANTHOCYANIN:

1

DISTRIBUTION:

1=Absent
2=Margin Only

3=Spotted
4=Throughout

5=OTHER (specify)

N/A

CONCENTRATION:

1=Light

2=Moderate

3=Intense

1

ROLLING:

1=Absent

2=Present

2

CUPPING:

1=Uncupped

2=Slight

3=Markedly

1

REFLEXING:

1=None

2=Apical Margin

3=Lateral Margins

4. MATURE LEAVES (observe harvest-mature outer leaves):

NOTE: Provide color photo of harvest-mature leaves which accurately shows color and margin characteristics.

MARGIN:

<input type="checkbox"/> 1	INCISION DEPTH: (deepest penetration of the margin)	1=Absent/Shallow (Dark Green Boston)	2=Moderate (Vanguard)	3=Deep (Great Lakes 659)
<input type="checkbox"/> 1	INDENTATION: (finest divisions of the margin)	1=Entire (Dark Green Boston)	3=Deeply Dentate (Great Lakes 659)	5=OTHER (specify)
		2=Shallowly Dentate (Great Lakes 65)	4=Crenate (Vanguard)	
<input type="checkbox"/> 1	UNDULATION OF THE APICAL MARGIN:	1=Absent/Slight (Dark Green Boston)	2=Moderate (Vanguard)	3=Strong (Great Lakes 659)
<input type="checkbox"/> 4	GREEN COLOR:	1=Very Light Green (Bibb)	3=Medium Green (Great Lakes)	5=Very Dark Green
		2=Light Green (Minetto)	4=Dark Green (Vanguard)	6=OTHER
ANTHOCYANIN (grown at or below 10 C):				
<input type="checkbox"/> 1	DISTRIBUTION:	1=Absent	3=Spotted (Calif. Cream Butter)	5=OTHER (specify)
		2=Margin Only (Big Boston)	4=Throughout (Prize Head)	
<input type="checkbox"/> N/A	CONCENTRATION:	1=Light (Iceberg)	2=Moderate (Prize Head)	3=Intense (Ruby)
<input type="checkbox"/> 2	SIZE:	1=Small	2=Medium	3=Large
<input type="checkbox"/> 1	GLOSSINESS:	1=Dull (Vanguard)	2=Moderate (Salinas)	3=Glossy (Great Lakes)
<input type="checkbox"/> 2	BLISTERING:	1=Absent/Slight (Salinas)	2=Moderate (Vanguard)	3=Strong (Prize Head)
<input type="checkbox"/> 3	LEAF THICKNESS:	1=Thin	2=Intermediate	3=Thick
<input type="checkbox"/> 1	TRICHOMES:	1=Absent (smooth)	2=Present (spiny)	

5. PLANT (at market stage. Choose a comparison variety appropriate for this type.):

SPREAD OF FRAME LEAVES:

☐ 20 cm This Variety ☐ 18 cm KING HENRY (specify comparison variety)

HEAD DIAMETER (market trimmed with single cap leaf):

☐ cm This Variety ☐ cm (specify comparison variety)

☐ 5 HEAD SHAPE: 1=Flattened 2=Slightly Flattened 3=Spherical 4=Elongate 5=Non-Heading 6=OTHER

☐ 2 HEAD SIZE CLASS: 1=Small 2=Medium 3=Large

☐ 24 HEAD COUNT PER CARTON

HEAD WEIGHT:

☐ 0730 g This Variety ☐ 0752 g KING HENRY (specify comparison variety)

☐ 1 HEAD FIRMNESS: 1=Loose 2=Moderate 3=Firm 4=Very Firm

6. BUTT (bottom of market-trimmed head):

☐ 1 SHAPE: 1=Slightly Concave 2=Flat 3=Rounded

☐ 3 MIDRIB: 1=Flattened (Salinas) 2=Moderately Raised 3=Prominently Raised (Great Lakes 659)

7. CORE (stem of market-trimmed head):

☐ 45 mm Diameter at base of head

☐ Ratio of head diameter/core diameter

Core height from base of head to apex:

☐ 69 mm This Variety ☐ 69 mm KING HENRY (specify comparison variety)

8. BOLTING (Give First Water Date _____):

NOTE: First Water Date is the date seed first receives adequate moisture to germinate. This can and often does equal the planting date.

☐ 079 Number of days from First Water Date to seed stalk emergence (summer conditions):
This Variety ☐ (specify comparison variety)

☐ 2 BOLTING CLASS: 1=Very Slow 2=Slow 3=Medium 4=Rapid 5=Very Rapid

☐ 102 Height of mature seed stalk:
cm This Variety ☐ cm (specify comparison variety)

37

Spread of Bolter Plant (at widest point):

cm This Variety

cm

(specify comparison variety)

1

BOLTER LEAVES:

1=Straight

2=Curved

1

MARGIN:

1=Entire

2=Dentate

3

COLOR:

1=Light Green

2=Medium Green

3=Dark Green

BOLTER HABIT:

1

TERMINAL INFLORESCENCE:

1=Absent

2=Present

1

LATERAL SHOOTS:
(above head)

1=Absent

2=Present

1

BASAL SIDE SHOOTS:

1=Absent

2=Present

9. MATURITY (earliness of harvest-mature head formation):

NOTE: Complete this section for at least one season.

SEASON	Applic. 1/ #of days	Check 1/ #of days	CHECK VARIETY 2/
Spring			N/A
Summer	63	65	KING HENRY
Fall	65	69	KING HENRY
Winter			N/A

Give planting date(s), and location(s):

Spring

N/A

Summer

MAY 18 CHUALAR, CA.

Fall

SEPTEMBER 16 YUMA, AZ.

Winter

N/A

1/ First water date to harvest.

2/ Fill in check variety name on the appropriate line.

10. ADAPTATION:

PRIMARY REGIONS OF ADAPTION (tested and proven adapted):

(0=Not tested

1=Not Adapted

2=Adapted)

2

Southwest (Calif., Ariz. desert)

2

West Coast

0

Northeast

0

Northcentral

0

Southeast

0

OTHER

SEASON:

0

Spring (area YUMA, AZ.)

0

Fall (area YUMA, AZ., IMPERIAL, CA.)

0

Summer (area SALINAS VALLEY)

0

Winter (area)

0

GREENHOUSE:

0=Not tested

1=Not Adapted

2=Adapted

3

SOIL TYPE:

1=Mineral

2=Organic

3=Both

11. DISEASES AND STRESS REACTIONS (0=Not tested; 1=Susceptible; 2=Intermediate; 3=Resistant; 4=Highly resistant; 5=Tolerant):

VIRUS

- ☒ 2 Big Vein
☒ 1 Lettuce Mosaic
☐ 0 Cucumber Mosaic
☐ 0 Broad Bean Wilt
☐ 0 Turnip Mosaic
☐ 0 Beet Western Yellows
☐ 0 Lett. Infectious Yellows
☐ Other Virus _____

INSECTS

- ☐ 0 Cabbage Loopers
☐ 0 Root Aphids
☒ 1 Green Peach Aphid
☐ Other Insect _____

FUNGAL/BACTERIAL

- ☐ 0 Corky Root Rot (Pythium Root Rot)
☒ 1 Downy Mildew (Races IIA, IIB, III, V)
☐ 0 Powdery Mildew
☒ 4 Sclerotinia Rot
☐ 0 Bacterial Soft Rot (Pseudomonas spp. & others)
☐ 0 Botrytis (Gray Mold)
☐ OTHER Rhizomonas suberifaciens

RAD 7/22/05

PHYSIOLOGICAL/STRESS

- ☒ 4 Tipburn
☒ 4 Heat
☐ 0 Drought
☒ 2 Cold
☐ 0 Salt
☒ 3 Brown Rib (Rib Discoloration, Rib Blight)
☐ OTHER _____

POST HARVEST

- ☒ 3 Pink Rib
☐ 0 Russet Spotting
☐ 0 Rusty Brown Discoloration
☐ 0 Internal Rib Necrosis (Blackheart, Gray Rib, Gray Streak)
☐ 0 Brown Stain

12. BIOCHEMICAL OR ELECTROPHORETIC MARKERS:

13. COMMENTS:

SUGGESTED CHECK VARIETIES

- TYPE
 1) CUTTING/LEAF
 2) BUTTERHEAD
 3) BIBB
 4) COS, OR ROMAINE
 5) GREAT LAKES GROUP
 6) VANGUARD GROUP
 7) IMPERIAL GROUP
 8) EASTERN GROUP
 9) STEM
 10) LATIN

- CHECK VARIETY
 SALAD BOWL
 DARK GREEN BOSTON
 BIBB
 PARRIS ISLAND
 GREAT LAKES 659-700
 VANGUARD
 VIVA
 ITHACA
 CELTUCE
 MATCHLESS

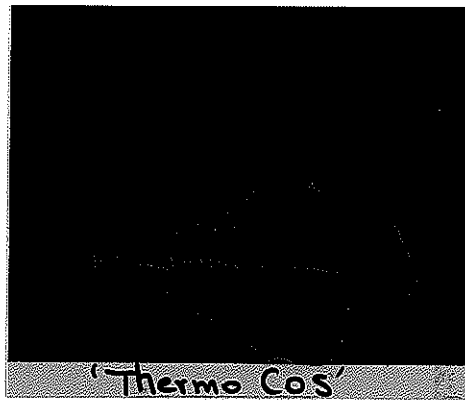
Exhibit D. Additional Description of Lettuce 'Thermo Cos'

Figure 2. 'Thermo Cos' cotyledon at fourth leaf stage from a 20-day-old seedling.

200 100 150

Exhibit D. Additional Description of Lettuce 'Thermo Cos'



Figure 3. 'Thermo Cos' lettuce at market stage. Salinas Valley, California. July 12, 2000.

00100156

Exhibit D. Additional Description of Lettuce 'Thermo Cos'



Figure 4. Commercial production of 'Thermo Cos' lettuce at market stage. Salinas Valley, California. July 12, 2000.

11-00153

Exhibit D. Additional Description of Lettuce 'Thermo Cos'

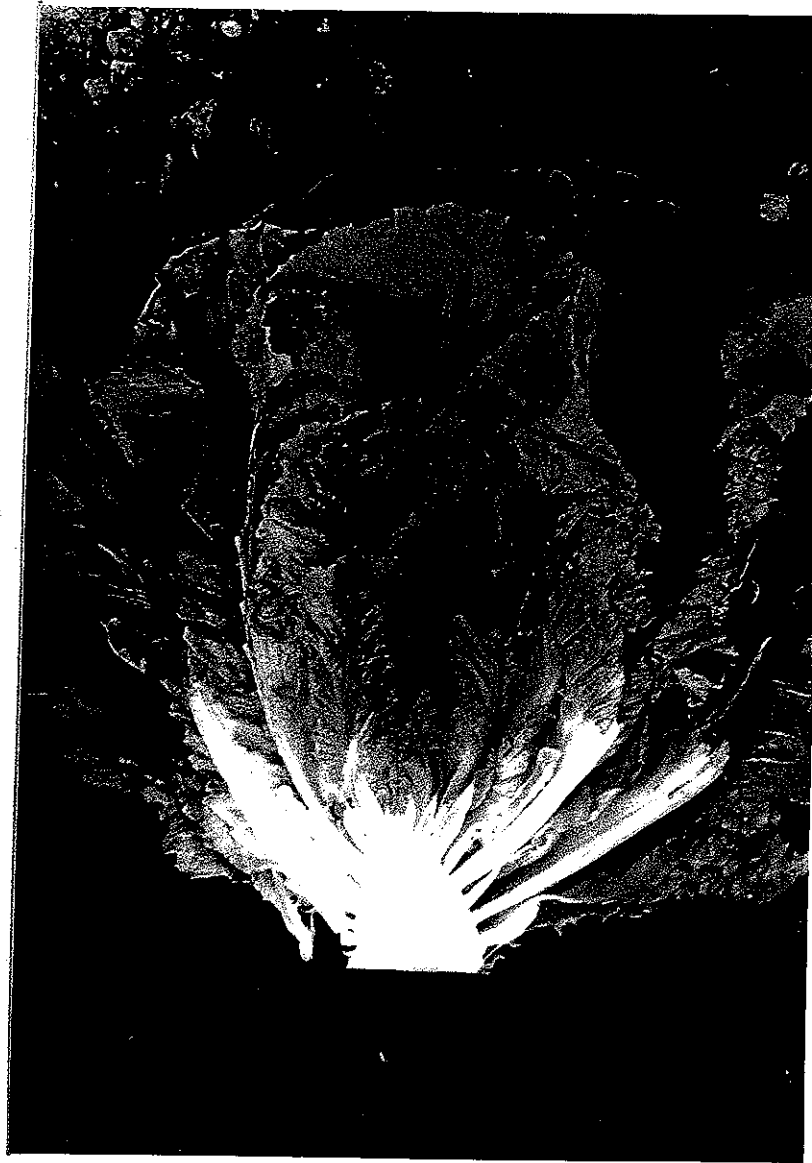


Figure 5. Interior and core length appearance of 'Thermo Cos' at market stage. Salinas Valley, California. July 12, 2000.

Exhibit D. Additional Description of Lettuce 'Thermo Cos'



Figure 6. Commercial production of 'Thermo Cos' lettuce grown for hearts at market stage. Salinas Valley, California. July 12, 2000.

Exhibit D. Additional Description of Lettuce 'Thermo Cos'



Figure 7. 'Thermo Cos' at seed stage. Central Valley Seeds, Inc. Commercial seed production Field, Five Points, California. August 17, 2000.



CENTRAL VALLEY SEEDS, INC.

Sanger, CA 93657
Salinas, CA 93907

1881 S. Leonard Ave.
485 Victor Way, Suite 10

(209) 233-9076
(408) 757-0939

Exhibit E. Statement of the Basis of Applicant's Ownership
(Attachment)

March 12, 2001

Tony M. Avila and Adolfo Maderos developed the lettuce variety 'Thermo Cos' that has been entered in this Plant Variety Protection application for Central Valley Seeds, Inc.

Tony M. Avila, Dan M. Avila, Joe M. Avila and John M. Avila equal owners of Central Valley Seeds, Inc. own 'Thermo Cos'. The ownership name of the PVP certificate shall be under the name of **CENTRAL VALLEY SEEDS, INC.**

Sincerely,

Tony M. Avila
Vice President of Sales and Research & Development
Central Valley Seeds, Inc.

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

1. NAME OF APPLICANT(S) Tony Avila, Dan Avila, Joe Avila, John Avila Central Valley Seeds, Inc.	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER GP2-2-7-3-3-1-mass-mass-mass	3. VARIETY NAME Thermo Cos
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) 485 Victor Way, Suite 10 Salinas, Ca. 93907	5. TELEPHONE (include area code) (831) 757-0939	6. FAX (include area code) (831) 757-6829
7. PVPO NUMBER 200100135		

8. Does the applicant own all rights to the variety? Mark an "X" in appropriate block. If no, please explain.

☒ YES ☐ NO

9. Is the applicant (individual or company) a U.S. national or U.S. based company?
If no, give name of country

☒ YES ☐ NO

10. Is the applicant the original owner? ☒ YES ☐ NO If no, please answer the following:

a. If original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. national(s)?

☐ YES ☐ NO If no, give name of country

b. If original rights to variety were owned by a company, is the original owner(s) a U.S. based company?

☐ YES ☐ NO If no, give name of country

11. Additional explanation on ownership (If needed, use reverse for extra space):

See attached sheet of Exhibit E
"Statement of the Basis of Applicant's Ownership"

PLEASE NOTE:

Plant variety protection can be afforded only to owners (not licensees) who meet one of the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definition.

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 10 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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